

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
29 December 2004 (29.12.2004)

PCT

(10) International Publication Number  
**WO 2004/114423 A1**

- (51) International Patent Classification<sup>7</sup>: **H01L 33/00**, 29/22, 29/24
- (21) International Application Number: PCT/US2004/018387
- (22) International Filing Date: 10 June 2004 (10.06.2004)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
10/462,089 13 June 2003 (13.06.2003) US
- (71) Applicants (for all designated States except US): **COTCO AMERICA INC.** [US/US]; 1759 South Main Street, Suite 104, Milpitas, CA 95035 (US). **COTCO INTERNATIONAL LTD.** [SG/CN]; 6th Floor, Photonics Centre, No.2, Science Park East Ave., Hong Kong Science Park, Pak Shek Kok, Hong Kong (CN).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **KEONG, Chan, Mun** [SG/CN]; 6-A Bellevue Heights, 8 Tai Hang Drive, Hong Kong (CN). **LAU, Victor, Yue, Kwong** [CN/CN]; 22H Block 31, Laguna City, Kwun Tong, Hong Kong (CN).
- (74) Agents: **SAMPLES, Kenneth, H.** et al.; Fitch, Even, Tabin & Flannery, 120 South LaSalle Street, Suite 1600, Chicago, IL 60603 (US).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:  
— with international search report
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: SURFACE MOUNTABLE LIGHT EMITTING DEVICE

(57) Abstract: This invention relates to a surface mountable light emitting device in which the lead frame is exposed over a substantial portion of the underside of the device so as to allow greater thermal conductivity to any device on which it may be mounted. The LED provides the lens and a molded body to encapsulate the lead frame and an electrical contact in a single molding step while the lead frames and further contacts are arranged in a suitable array. The lens couples the luminous output of a light-emitting diode (LED) to a predominantly spherical pattern comprises a transfer section that receives the LED's light within it and an ejector atop it that receives light from the transfer section and spreads it spherically. Applications may include, but are not limited to, household light bulbs and car headlights.